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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/806,910	03/23/2004	Paul W. Graf	2003-0658.02	3879

21972 7590 11/24/2008
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LEXINGTON, KY 40550-0999

EXAMINER

STOREY, WILLIAM C

ART UNIT	PAPER NUMBER
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2625

MAIL DATE	DELIVERY MODE
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11/24/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/806,910

Applicant(s)

GRAF ET AL.

Examiner

WILLIAM C. STOREY

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-11, 14,15,17,18,20,23-28 and 31-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-11, 14,15,17,18,20,23-28 and 31-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 3/23/04 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Final Drawing Review (PTO-849)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a) because they fail to show heater chip 16 as described in the specification. Though the specification says that it is not visible, it still has a numerical reference and is an essential element to the invention. Please provide the chip and show its connections. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the limitations of claim 31 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the data stream module performing the functions recited in claim 38 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the data stream register adapted to insert the reference data stream of claim 39 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure

number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

5. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the data stream register and the data validating controller of claim 20 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for

consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claim 28 (and dependents) is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 28 claims inserting a reference data stream into a first serial data stream. Thus, the first serial data stream is data not including the reference data stream. The claim then goes on to discuss searching for a validating data stream from the transmitted first serial data stream (data not including the reference data stream) comprising a valid data stream pattern. It is assumed that the reference data stream is the validating data stream (§27 of the instant

application, for example, describes how the "known bit pattern, or the reference data stream," is sought for validation of the received data stream.). Please provide support describing searching the first serial data stream (excluding the reference data stream) for a validating data stream (not the reference data stream since that is not part of the first serial data stream that is being searched) to validate the first serial data stream based on a valid data stream pattern.

8. Claim 38 (and dependents) is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains material which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s) had possession of the claimed invention at the time the invention was filed. A patent must describe the technology that is sought to be patented; the requirement serves both to satisfy the inventor's obligation to disclose the technologic knowledge upon which the patent is based, and to demonstrate that the patentee was in possession of the invention that is claimed to put the public in possession of what the applicant claims as the invention. Further, the written description requirement promotes the progress of the useful arts by ensuring that patentees adequately describe their inventions in their patent specifications in exchange for the right to exclude others from practicing the invention for the duration of the patent's term. Please provide the description for the claimed data stream module (i.e. the print head comprising a data stream module adapted to retrieve the first data stream from the memory, to insert a reference data stream comprising a

reference pattern into the first data stream at a reference location thereby forming a transmit data stream).

9. Claim 11 (and dependents) is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains material which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s) had possession of the claimed invention at the time the invention was filed. A patent must describe the technology that is sought to be patented; the requirement serves both to satisfy the inventor's obligation to disclose the technologic knowledge upon which the patent is based, and to demonstrate that the patentee was in possession of the invention that is claimed to put the public in possession of what the applicant claims as the invention. Further, the written description requirement promotes the progress of the useful arts by ensuring that patentees adequately describe their inventions in their patent specifications in exchange for the right to exclude others from practicing the invention for the duration of the patent's term. Please provide support for receiving a command at the print head from the printer host, the command comprising a request for a reference data stream at a reference location within the data stream.

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claim 37 (and dependents) is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In the case that the "first serial data

stream" as discussed in claim 28 is supposed to comprise the data before insertion of the reference data stream and data inclusive of the referenced data stream after it is inserted, it is unclear as to which "first serial data stream" the applicant is referring. It is assumed that the applicant refers to the "first serial data stream" solely as data before the insertion of the reference data stream. Otherwise, if taken as inclusive of the reference data stream as well, it would be impossible for the reference data stream to be formed with a plurality of bits independent of the first serial data stream, since the first serial data stream would be inclusive of those bits comprising the reference data stream. (Please take into consideration the 112-1st rejection of claim 28 for further insight.)

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 28, 32-35, 38-39, 41-42, 11, 14-15, 20, 23-24, 1, 4-6, & 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bullock et al. (US 6065824), hereinafter referred to as Bullock1; in view of admitted prior art and/or Gibson et al. (US 6161916), hereinafter referred to as Gibson; and/or Bullock et al. (US 5835817), hereinafter referred to as Bullock2; and/or Skene et al. (US 5835817), hereinafter

referred to as Skene; and/or Hepworth et al. (US 3975712), hereinafter referred to as Hepworth. The references listed may provide further support, as necessary.

Regarding claim 28, Bullock1 discloses a print head (a print head may be read upon by the print head 18 and the ink cartridge with the memory 30 (also 30'), including necessary interconnects between the two. Nonetheless, it would have been at least obvious to provide a memory chip attached to the printhead to provide information about the printhead, allowing for greater awareness. Additionally, the applicant's admitted prior art in ¶2 discloses that it is well known to provide a print head memory to provide similar information about the print head. Gibson discloses a memory device on the printhead (col. 3, lines 20-22). For the same reason, it would have been obvious to provide a memory device for the print head and communicate similarly.) synchronously sequencing and transmitting a first serial data stream according to a clocking control signal (Fig. 4, col. 5, lines 23-43. a serial clock line provides a clocking control signal that samples data based on the clock (thus the serial data is synchronously sequenced out based on the sample timings)). Bullock1 discloses a print controller adapted to be coupled to the print head, and configured to receive the first serial data stream from the print head (fig. 1a, 2, 4. A controller coupled to the "print head" (containing memory) is shown. This effectively connects the memory with the host computer, as well. Thus, the controller and/or host computer could read on claimed "controller," as well. Col. 5, lines 30-33 and col. 4, lines 65-67 show the memory (on the print head) communicating data to the controller. Col. 3, lines 47-56 disclose the information from the print head memory being read to update the print driver parameter information on the host

computer. Additionally, considering this, it would have been at least obvious to have the memory coupled to the host computer to effect a more direct link for updating the printer driver parameter information.)

Although the previous disclosures did not distinctly disclose the print head configured to insert a reference data stream into a first serial data stream at a reference location; and the print controller adapted to search for a validating data stream from the transmitted first serial data stream, to validate the received first serial data stream when the validating data stream comprises a valid data stream pattern, to recognize an incorrect received first serial data stream, and to detect a framing error or a link error from the incorrect received first serial data stream, Bullock1 discloses uses a communication protocol to ensure orderly transfer of the data stream (col. 5, lines 35-37).

In a similar field of endeavor, Bullock2 discloses an interface protocol for serial data transmission (col. 4, lines 26-33 disclose a protocol for serial communication. It describes how various length pulses are employed which evidence the beginning of a read/write action. These start pulses may read on claimed reference data stream as they reference the start of the core data. Also, since these pulses are not part of the core data (first serial data stream before the reference data is added) in the memory to be transmitted or read, this shows the capability to insert the reference data stream into the first serial data stream for transmission. This also evidences the beginning of a read/write action, and therefore, shows that the pulses/bits that are the reference data stream are inserted at a particular location (since it evidences the beginning of a

read/write action it must be at the beginning). By the definition of a protocol, it would have been obvious to one of ordinary skill in the art to provide the receiver (print controller, in this case) of the data searching for a validating data stream (in accordance with the protocol expected, searching for evidence of the beginning of a read/write action in order to properly respond). It would have been obvious to respond by reading or writing according to evidence of a read/write action (thus, showing validation of the received first serial data stream when the validating data stream comprises a valid data stream pattern) for the purpose of greater control and/or efficiency. In addition, if there is no evidence of an action according to protocol, it would have been obvious to not respond with the action (thus, recognize an incorrect received first serial data stream since there was not the indicator of the action according to protocol.) Further, the use of start pulses, or bits, to evidence the beginning of a read/write action would aid to prevent error, such as a framing or link error, thus reading on claimed detect a framing a framing error or a link error from the incorrect received first serial data stream. If the data stream is missing the evidence of the start of reading/writing, then it may be concluded that an error, like a framing or link error, occurred.

Nonetheless, the use of protocol in the claimed manner is notoriously well-known in the art. For example, Skene discloses using the inclusion of a parity bit (may be considered as, or part of, a reference data stream) in order to detect errors after transmission from memory on a print head to a controller (column 4, lines 11-20 and figure 1. Skene discloses setting parity bits in data that are to be communicated in order to detect possible errors; as disclosed at column 7, lines 55-58, lines 55-63, fig. 3.

Skene discloses checking the parity bit that was included in the data stream to check whether or not the data has an error, which reads on claimed validating the first serial data stream when the validating data stream has a valid data stream pattern when the validating data stream has been found. In addition, it is disclosed detecting an incorrect received first serial data stream; as disclosed at column 8, lines 35-45, fig. 5a-5b, for example.) Thus, it is shown to be well known to use the addition of an extra bit or data to detect whether errors have occurred in transmitted data from a memory in a printer to a controller. It would have been obvious to implement such an idea in order to provide for greater robustness and/or awareness in the system.

Additionally, Hepworth provides support. Bullock discloses a clock signal acting to sequence out data. Similarly, Hepworth discloses data being shifted out in synchronization with a clock signal (col. 3, lines 24-52). Hepworth discloses, after the data is serialized for transmission, inserting a start bit and a trailing stop bit or bits and that a parity may be included, as disclosed in column 7, lines 23-30. Col. 7, lines 23-30 disclose that two stop bits are trailing and that the parity is inserted between the last data bit and the first stop bit, thus reading on claimed adding the reference data stream into the data stream at the reference location. In addition, the two stop bits and the parity are adjacent and comprise a bit width of at least two adjacent bits. Hepworth discloses searching for the reference data stream at the reference location within the received first serial data stream: the nature of stop bits and their being able to be interpreted as signaling a "stop," makes it inherent that they be searched out in order to correspond with a stop. In addition, col. 7, lines 58-67 & col. 8, lines 1-6 disclose

checking for errors based off the reference bits that had been placed at their respective reference positions. A status register is set based on errors, which correspond to the reference bits. In addition, the parity bit is stripped from data being transferred to receiver data register. Therefore, the reference bits must have been searched for in order for these actions to occur. If no error is found, then the data stream may be said to be validated by a valid data stream pattern. The disclosure of Hepworth provided specifically mentions detecting for a framing error.

Bullock has disclosed in the two mentioned applications using a protocol for communication, which may include inserting bits (pulses) to notify the beginning of a string of data. Hepworth provides a more robust protocol, by including parity and stop bits. These reference insertions allow for the prevention of error mentioned by Hepworth. In addition, as Bullock inherently interprets the protocol bits to determine the start of data and/or writing/reading action, Hepworth provides checking the protocol at the other end as well. Hepworth shows interpretation of the protocol that would allow for greater error prevention, as described. As Bullock may insert and interpret according to protocol, it would have been obvious to modify Bullock by providing greater robustness, as described.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the previous disclosures by specifically providing the claim limitations, as taught by discussions provided, for the purpose of providing greater control, flexibility, robustness, and/or awareness.

Regarding claim 32, the claim is rejected based upon similar reasoning as applied above for claim 28. It was previously discussed how the print head may include the memory; thus, actions that were previously disclosed as being performed by the memory may be understood to be performed by the print head. Nonetheless, as the action is shown being accomplished, it would have been at least obvious to one of ordinary skill in the art to provide the print head retrieving the first serial data stream for at least the purpose of providing greater control, or providing a predictable result.

Regarding claim 33, the claim is rejected based upon similar reasoning as applied above for claim 28, and inherits everything as applied above for claim 32. Bullock disclosed using various length pulses to evidence the beginning of a read/write action (thus reading on claimed plurality of start bits). Additionally, Hepworth previously disclosed providing multiple stop bits and a parity bit. These discussions provide for the limitations of the claim.

Regarding claim 34, the claim is rejected based upon similar reasoning as applied above for claim 28. In addition, the claim inherits everything as applied above for claim 33. Skene and Hepworth both disclosed the use of a parity code above, which reads on claimed wherein the error detection bit comprises at least one of a parity check code, residue code, "m" of "n" code, duplication code, cyclic code, arithmetic code, Berger code, Hamming code, horizontal parity code, or vertical parity code.

Regarding claim 35, claim 35 is rejected based on reasoning supplied above for claim 28. In addition, the claim inherits everything as applied above for claim 32. Skene discloses the controller comparing the parity code with the pattern it should

match to, which reads on claimed wherein the print controller compares the reference pattern with the valid data pattern (odd or even parity); as disclosed at column 8, lines 36-37. In addition, Hepworth provided at the receiving end of the transmission to check the parity, start, and stop bit reference data stream pattern (placement, even or odd parity) against what is known to be valid in order to determine errors. Further, it was discussed above how interpreting protocol (such as understanding the beginning of a read/write action) occurs from the Bullock references.

Regarding claim 38, the claim is similarly rejected by discussions provide for claim 28. It was discussed previously how the "print head" as claimed may be inclusive of the memory and its functions. The host may be read upon by the controller. It was disclosed how data was transferred serially from the memory according to read address information. Thus, storing the first data stream in memory is provided for. Inherently, as the data is provided from the memory for transmission, there must be a data stream module adapted to retrieve the first data stream from the memory. In addition, the Bullock references disclosed being able to add protocol pulses (reference pattern) that indicate referential information external to the actual core data; thus, inherently providing for a data stream module adapted to insert a reference data stream comprising a reference pattern into the first data stream at a reference location (was discussed providing it at the beginning to tell/detect a the start of a read/write action) thereby forming a transmit data stream. In addition, other protocol references were discussed previously. The rest of the limitations have been similarly provided for from the previous discussions of claim 28. It was disclosed previously searching for the

reference data stream portion to validate the transmission. Thus, the received data stream would comprise the transmit data stream with the inserted reference data stream at the reference location.

Regarding claim 39, it was previously disclosed how a data stream module inserts a reference data stream. Thus, the instrument that accomplishes this may be called a data stream register. Nonetheless, it would have been obvious to provide a register, such as a shift register, to allow for the insertion of data at a particular position according to the clock sequence. Bullock¹ previously discussed sampling the data output at the clock frequency. Hepworth provides an example of how a shift register may be used in this capacity. Hepworth discloses that when the data is ready to be transmitted, the information in the data register, is sent to the transmit shift register, which may read on claimed data stream register; and inserted are a start bit and a trailing stop bit or bits and a parity may be included, which reads on claimed data stream register adapted to insert the reference data stream (col. 3, lines 26-31 and col.7, lines 23-30). (The particular example of Hepworth should not be approached too narrow-minded. Though the patent may be from 1976, one of ordinary skill would be able to adapt with updates in technology to provide the most compatible shift register for the scenario at hand (i.e. accommodate for the necessary serial/parallel input/output, necessary size, etc.). Hepworth generally shows how a shift register may be used to allow for the insertion of reference portions into a data stream.)

Regarding claim 41, the claim is rejected based upon similar reasoning as applied above for claim 33. In addition, the claim inherits everything as applied above for claim 38.

Regarding claim 42, the claim is rejected based upon similar reasoning as applied above for claim 34. In addition the claim inherits everything as applied above for claim 41.

Regarding claim 11, the claim is rejected based upon similar reasoning as applied above for claim 28. It was previously disclosed adding (inserting) a reference data stream into the data stream (first serial data stream of claim 28) at the reference location, thereby forming a first serial data stream. Inherently, the data stream (first serial data stream of claim 28) is retrieved from the print head memory. It was previously discussed how the data from the memory is transmitted out to the controller. Thus the data stream would have had to have been retrieved. Printer host may be read upon by the controller from claim 28. It was previously disclosed receiving the first serial data stream at the printer host (controller) from the print head (including memory), wherein the act of receiving comprises the acts of providing a clocking control signal from the printer host and utilizing the clocking control signal to synchronously sequence the first serial data stream. It was previously discussed searching for the reference data stream at the reference location within the received first serial data stream; validating the received first serial data stream when the received first serial data stream comprises the reference data stream at the reference location; and recognizing an incorrect received first serial data stream; and detecting a framing error or a link error from the

incorrect received first serial data stream. The discussion for the validating data stream comprising a valid data pattern from claim 28 provides for the claimed reference data stream at the reference location. Bullock1 discloses at col. 5, lines 27-30 disclose the controller (printer host) sending a command that the memory (print head (inclusive of memory)) receives. The read command requests data (data stream) from the memory. In addition, it was previously discussed how Bullock1 adheres to a protocol to communicate between the memory controller. The protocol is expected from the controller. Thus, the command from the controller can be seen to include an inherent request to adhere to protocol. Nonetheless, it would have been obvious to one of ordinary skill in the art to provide a request for adherence to protocol in order to provide greater control and/or error deterrence. From other discussions provided for claim 28, protocol was disclosed requiring the insertion of reference data streams at reference locations within the data stream. For example, Bullock2 disclosed inserting various length pulses to evidence the beginning of a read/write action. In addition, Hepworth provided an additional protocol reference data scheme. Both of these references depicted the reference data stream comprising a bit width of at least two adjacent bits (various length pulses (plural) from Bullock2, two stop bits from Hepworth.) Nonetheless, it would have been obvious to provide a reference data stream comprising a bit width of at least two adjacent bits in order to provide a more specific reference pattern (as opposed to just one bit), that would be harder to misinterpret or accidentally replicate; thus, providing for a more robust scheme. For further support, the applicant's admitted prior art at ¶3 provides for the printer sending a command to the print head,

the print head responding by sending data via electronic digital communications to the printer in order to complete the command. This would provide integration and communication in the system if it were not effectively represented before.

Regarding claim 14, the claim inherits everything as applied for claim 11.

Regarding claim 14, the claim is rejected based upon similar reasoning as applied above for claim 33.

Regarding claim 15, the claim inherits everything as applied above for claim 14.

Regarding claim 15, the claim is rejected based upon similar reasoning as applied above for claim 34.

Regarding claim 20, the claim is rejected based upon similar reasoning as applied above for claim 28. Controller may read on the host. It was previously discussed a clocking control signal generated by the host (control on the serial clock line); a print head communication link coupling the print head and the host (previous and fig. 4), and configured to communicate a first serial data stream between the print head and the host, wherein the first serial data stream is synchronously sequenced at a frequency of the clocking control signal (previously disclosed, The clock line ensures that data is properly transferred on the communication line. The data is sampled out on a transition of the clock line from low to high (thus, at the frequency of the clock control signal.)). The claim reads a data stream register (the memory may provide for the register) coupled to the print head (which may include the memory), and configured to insert a reference data stream into the first serial data stream at a reference location (previously discussed); and a data validating controller coupled to the host, and

configured to validate the first serial data stream based on the reference data stream, recognize an incorrect first serial data stream, and detect a framing error or a link error from the incorrect first serial data stream (also previously discussed; as it was discussed how the receiving end (the controller) may interpret the protocol in order to interpret the data, and thus, validate it, a data validating controller may be provided for by the controller.)

Regarding claim 23, the claim inherits everything as applied above for claim 20. Regarding claim 23, the claim is rejected based upon similar reasoning as applied above for claim 33. The print head of claim 33 may provide for the data stream register (the memory may be part of the print head).

Regarding claim 24, the claim inherits everything as applied above for claim 23. Regarding claim 24, the claim is rejected based upon similar reasoning as applied above for claim 34.

Regarding claim 1, the claim is rejected based upon similar reasoning as applied above for claim 11 (and thus, claim 28). It was previously discussed receiving the transmission; the current claim claims the communicating of the transmission, which has been previously provided for. In addition, at least inherently, the data is communicated to be received in the manner disclosed in claim 11. The limitations inserting a reference data stream into the first serial data stream; and validating the first serial data stream based on the reference data stream, have also been previously provided for.

Regarding claim 4, the claim inherits everything as applied above for claim 1. The limitations of claim 4 have also been previously discussed. The previous discussions disclosed inserting a reference data stream into "the first serial data stream" of claim 4 and then validating the stream based on the reference data stream. Thus, they both must have been transmitted. It has been discussed that the controller (printer host) receives the data stream and interprets protocol reference inserts. Thus, the printer host receives the stream.

Regarding claim 5, the claim inherits everything as applied above for claim 4. Regarding claim 5, the claim is rejected based upon similar reasoning as applied above for claim 33.

Regarding claim 6, the claim inherits everything as applied above for claim 5. Regarding claim 6, the claim is rejected based upon similar reasoning as applied above for claim 34.

Regarding claim 10, the claim inherits everything as applied above for claim 1. Regarding claim 10, the claim is rejected based upon similar reasoning as applied above for claim 11. Claim 11 provided retrieving a data stream from a print head memory (it has previously been discussed how the data stream is stored in memory).

3. Claims 31 & 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over the previous disclosures as applied to claim 28 and/or 20 above, and further in view of Barbour et al. (US 6476928), hereinafter referred to as Barbour.

Regarding claim 31, the claim inherits everything as applied above for claim 28. It was previously disclosed how there was a memory included as part of the "print

head." As the previous disclosures have provided for retrieving a first serial data stream from the memory, and as this is accomplished by the memory, which is part of the print head, it may be said that the print head retrieves the first serial data stream from a print head. Nonetheless, as the action is shown being accomplished, it would have been at least obvious to one of ordinary skill in the art to provide the print head retrieving the first serial data stream for at least the purpose of providing greater control, or providing a predictable result.

Additionally, in a similar field of endeavor, Barbour discloses a system and method for controlling internal operations of a processor of an inkjet printhead. In addition, Barbour discloses a processor and various controllers within a printhead that may communicate with a memory in the printhead and Barbour discloses the memory holding sensor readings that the processor uses to make decisions, as disclosed at column 5, lines 17-20 and column 8, lines 40-50 and 57-59, which reads on claimed print head receives a first data stream from a print head memory. Thus it can be seen reasonable to one of ordinary skill in the art for the processor to take readings from the memory rather than directly from the sensors. Barbour also discloses the processor communicating with a main memory in a bi-directional manner, as disclosed at lines 40-45.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the previous disclosures by specifically providing a print head retrieving a first data stream from a print head memory, as taught by

Barbour, for the purpose of processing the data before sending it out to the main controller, allowing for at least greater control and/or flexibility.

Regarding claim 25, the claim inherits everything as applied above for claim 20. Regarding claim 25, the claim is rejected based upon similar reasoning as applied above for claim 31.

4. Claim 36-37, 40, 43, 17-18, 26-27, 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over the previous disclosures as applied above to claim 32, 38, 11, 5, and/or 1 and Ono et al. (US 6943911), hereinafter referred to as Ono; provides further support.

The Bullock references previously provided using various length pulses to evidence the beginning of a read/write action. The fact that the pulses are of various lengths would lend to the fact that the reference stream was formed with a non-uniform bit pattern. Nonetheless, in a similar field of endeavor, Ono discloses a protocol for communication. In addition, Ono discloses inserting a start bit, which reads on claimed reference data; constituted by an H and an L level before the data being transmitted for effect (claimed first serial data stream), as disclosed at column 5, line 67 and column 6, lines 1-2 and 8-9. Because the start bit is composed of two different levels, this reads on claimed forming the reference stream with a non-uniform bit pattern.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the previous disclosures by specifically providing forming the reference stream with a non-uniform bit pattern, as taught by Ono, for the purpose of providing greater robustness. A non-uniform bit pattern is more specific, and

harder to misinterpret or accidentally replicate. In addition, the non-uniform bit pattern of Ono would provide a graphical break between the start of data transmission that would be easier to interpret visually.

Regarding claim 37, the claim inherits everything as applied above for claim 32. It was disclosed earlier how a plurality of bits that may comprise the reference data stream were inserted into the first serial data stream. Thus, those bits were independent of the first serial data stream.

For further support, in a similar field of endeavor, Ono discloses a protocol for communication. In addition, Ono discloses inserting start bits, which reads on claimed reference data; constituted by an H and an L level before the data being transmitted for effect (claimed first serial data stream), as disclosed at column 5, line 67 and column 6, lines 1-2 and 8-9. Because the start bits will always be comprised of an H level and an L level, this reads on claimed forming the reference stream with a plurality of bits independent of the first data stream.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the previous disclosures by specifically providing forming the reference stream with a plurality of bits independent of the first data stream, as taught by Ono, for the purpose of providing greater robustness. A non-uniform bit pattern is more specific, and harder to misinterpret or accidentally replicate. In addition, the non-uniform bit pattern of Ono would provide a graphical break between the start of data transmission that would be easier to interpret visually.

Regarding claim 40, the claim is rejected based upon similar reasoning as applied above for claim 36. In addition, the claim inherits everything as applied for claim 38.

Regarding claim 43, the claim is rejected based upon similar reasoning as applied above for claim 37. In addition the claim inherits everything as applied above for claim 38. In this case, the plurality of bits discussed for claim 37 may provide for the data stream of claim 43. In addition, the reference data stream inserted into the first serial data stream may read on the reference data stream inserted into the first data stream.

Regarding claim 17, the claim inherits everything as applied above for claim 11. Regarding claim 17, the claim is rejected based upon similar reasoning as applied above for claim 37. The first serial data stream in claim 37 may provide for the data stream.

Regarding claim 18, the claim inherits everything as applied above for claim 11. Regarding claim 18, the claim is rejected based upon similar reasoning as applied above for claim 36. If a non-uniform bit pattern is used, then inherently, when the reference data stream is sought, the non-uniform bit pattern as at least part of that would be sought. Thus, it would be received first serial data stream would be checked for the reference data stream, and thus, the non-uniform bit pattern.

Regarding claim 26, the claim inherits everything as applied above for claim 20. Regarding claim 26, the claim is rejected based upon similar reasoning as applied

above for claim 36. The print head of claim 33 may provide for the data stream register (the memory may be part of the print head).

Regarding claim 27, the claim inherits everything as applied above for claim 20. Regarding claim 27, the claim is rejected based upon similar reasoning as applied above for claim 43.

Regarding claim 7, the claim inherits everything as applied above for claim 5. Regarding claim 7, the claim is rejected based upon similar reasoning as applied above for claim 36. One previously provided a plurality of start bits having at least two bits of different voltage values.

Regarding claim 8, the claim inherits everything as applied above for claim 1. Regarding claim 8, the claim is rejected based upon similar reasoning as applied above for claim 37.

Regarding claim 9, the claim inherits everything as applied above for claim 1. Regarding claim 9, the claim is rejected based upon similar reasoning as applied above for claim 36.

Response to Arguments

5. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Nonetheless, the examiner still feels that it would be beneficial to mention that often, references are cited for the general teachings that they provide. For example, if a reference is provided from 1976 and does not have most current technology, or is not set to work with a particular arbitrary number, etc., but still provides a useful

improvement that is generally taught, one of ordinary skill would be able to understand the general teaching and apply it in many situations. One of ordinary skill in the art would understand that if a reference provides working with a particular arbitrary number, the particularity of that number being extraneous to the general teaching, then it would be obvious to apply the general teaching using a particular arbitrary number applicable to the current scenario. Obviously, this may be assessed on a case-by-case basis; but in light of the applicant's provided remarks, the examiner feels this is a good observation to point out.

Additionally, with regard to the applicant's discussion concerning Bullock and Hepworth, the applicant provided a discussion on parallel-to-serial conversion. However, this was not the teaching that Hepworth was referenced to provide.

Further, the applicant makes allegations that combinations would be inoperable, even after proclaiming the combination would provide operation that would be slow (see pg. 17 of applicant's remarks, for example.) Even taking the applicant's remark that the operation would be slow *en arguendo*, the combination would still be operable, evidenced by the applicant's proclamation. Additionally, concerning speeds, slowness, quality of operation, etc. as discussed by the applicant, the applicant makes no claim to any measure of speed, etc. Therefore, if a reference, or combination of references, provides for the applicant's limitations, no matter how slow the operation went, the claim would still be read upon. In addition, it is obvious to one of ordinary skill in the art to update slower versions of technology with faster versions as they come along, to increase the speed of operation, etc.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Saruta et al. (US 6565198) discloses synchronous communication with an ink cartridge memory and a flag for detection of error after transmission.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM C. STOREY whose telephone number is (571)270-3576. The examiner can normally be reached on Monday - Friday Eastern Standard Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, King Y. Poon can be reached on (571) 272-7440. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/William C Storey/

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